

**Use Case 26: Network Modification – T. Berry****Network Modification****Summary:**

This use case shows the information exchanges required to make a modification to the CIM Wires Package data for the network model within a State Estimator component. This is a precondition of the State Estimation use case.

This use case is equally applicable to many other applications but is shown only for State Estimation for clarity.

**Actor(s):**

<b>Name</b>	<b>Role description</b>
System Operator (= Control Engineer)	(Human) Monitors and controls system operation
Telemetry System	(External System) Provides telemetry data in the form of analogue measurements, status, or accumulator data from substation, neighboring control center, or field device. Does not participate in this use case.
Data Maintenance Engineer	(Human) Creates, deletes and updates data defining network and telemetry.

**Participating Systems:**

<b>System</b>	<b>Services or information provided</b>
User Interface	Displays Data Acquisition data for the power system. Allows manual update of information.
Data Acquisition	A SCADA application that maintains latest measurements from Telemetry System and provides data for other subsystems in a form equivalent to CIM SCADA Package.
Data Definition	Defines network model used by State Estimator including identifiers of ConductingEquipment and Measurements in Data Acquisition. This subsystem may use more than one physical database.
Topology Processor	An application that processes switch states to determine TopologyNodes and TopologyIslands.
State Estimator	A Network application that holds a Power System Network Model equivalent to CIM Wires package. Creates the best estimate of current state of the power system. Includes state estimation and bad measurement detection.

**Pre-conditions:**

The Data Acquisition, User Interface and Data Definition subsystems are operational.

**Assumptions / Design Considerations:**

- The Data Acquisition subsystem, Topology Processor subsystem and the State Estimator subsystem have different internal representations of the power system network. They share the same identifiers for ConductingEquipment and Measurements. These identifiers may be numeric rather than character strings in order to improve performance.
- This use case is equally applicable if the Data Definition subsystem is implemented as separate components for Data Acquisition and State Estimator data. The important issue is that the identifiers are set before the State Estimator task is initialized.
- The State Estimator is assumed to have minimal user interface requirements but this includes the ability to start the subsystem.
- Frequency of use: Typically every 30 days in normal use. Could be every 30 minutes during test and commissioning.

#### Normal Sequence: Initialize from Data Definition

*(This shows in time order, the sequence of information exchanges between the subsystems)*

Use Case Step	Description
1	Data Maintenance Engineer modifies data in Data Definition Subsystem.
2	Data Definition Subsystem allocates numeric identifiers for new ConductingEquipment and Measurements.
3	System Operator halts Topology Processor and State Estimator subsystems if they are running.
4	System Operator requests Data Definition to update data in Data Acquisition including identifiers for new ConductingEquipment and Measurements. (Not shown on diagram).
5	System Operator starts Topology Processor and State Estimator subsystems.
6	System Operator requests Data Definition to initialize Topology Processor and State Estimator with data sets. These data sets include the identifiers of ConductingEquipment and Measurements.
7	Topology Processor fetches relevant states for all ConductingEquipment from Data Acquisition to guarantee consistency.

#### Post-conditions:

Topology Processor and State Estimator are consistent with Data Acquisition and ready for the State Estimation Use case triggered by telemetry events.

#### References:

This use case sets initial conditions for the State Estimator use case.

#### Information Exchanges:

See State Estimator use case.

#### Issues:

ID	Description	Status
2.	State Estimator could be initialized from a stored network data set but this may not necessarily have the same identifiers for ConductingEquipment and	

	Measurements as the Data Acquisition subsystem.	

**Revision History:**

<b>No</b>	<b>Date</b>	<b>Author</b>	<b>Description</b>
1.	15-Jan-99	T. Berry	Original – based on State Estimator use case diagram.
2	18-Jan-99	T. Berry	Aligned with IEM_notes.doc
3	24-Jan-99	T. Berry	Add separate Topology Process

**Use Case Diagram:**

See State Estimator use case.

